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New and noteworthy vascular plant records from the Polish part of the Lithuanian Lakeland

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Abstract: This paper provides a list of 40 vascular plant species recorded in 2015–2017 in the Polish part of the Lithuanian Lakeland (north-eastern Poland), using the ATPOL cartogram method. Two native taxa *Erigeron acris* subsp. *droebachiensis* and *Rorippa austriaca*, one established alien *Atriplex tatarica* and one casual alien *Aronia ×prunifolia* are reported as new to the flora of the region.

Key words: ATPOL cartogram method, distribution, floristics, Lithuanian Lakeland, Poland.

Introduction

The Lithuanian Lakeland is a physical-geographical macroregion between Poland, Russia (Kaliningrad Oblast), Lithuania and Belarus. The Polish part of the Lithuanian Lakeland (north-eastern Poland) covers about 3500 km² and comprises four mesoregions, namely Romincka Forest, Eastern Suwałki Lakeland, Western Suwałki Lakeland, and Augustów Plain (Kondracki 2002), which are located in a transitory temperate climate zone with some influence from the continental climate (Górniak 2000). The average annual air temperature is about 6.5 °C and the average annual precipitation is 550-600 mm (Lorenc 2005).

The vascular plant flora of the Polish part of the Lithuanian Lakeland has not been extensively studied, except the mesoregion of Western Suwałki Lakeland (Pliszko 2014, 2015a, 2016). However, there are numerous floristic records from selected areas (Pawlikowski 2008a, 2008b, Pliszko 2015a, Wołkowycki & Pawlikowski 2016 and the literature cited therein). In this paper, new floristic records of vascular plants in the Polish part of the Lithuanian Lakeland are provided, contributing to the ATPOL database (Zając & Zając 2001).

Material and methods

Field surveys were conducted in 2015-2017 using the ATPOL cartogram method (Zając 1978, Zając & Zając 2001). The 10-km square units of the ATPOL cartogram grid in which the presented taxa were recorded for the first time are shown in Fig. 1. The floristic list is arranged alphabetically, providing geographical-historical status in the regional flora, localities, habitats, and dates of recording. Plant identification followed the morphological features given by Rutkowski (2004). Nomenclature followed the concept by Mirek *et al*. (2002) and other authors (Rutkowski 2004, Pliszko 2015b). Geographical-historical status in regional flora followed Tokarska-Guzik *et al*. (2012) as well as own observations, with respect to the definitions of alien plant species proposed by Pyšek *et al*. (2004). The codes of the 10-km cartogram units were assigned to localities using the On-line ATPOL grid (Komsta 2016, www.komsta.net/atpol). Voucher specimens of selected species are deposited in the Herbarium of the Institute of Botany of the Jagiellonian University in Kraków (KRA).

Results and discussion

The floristic list comprises 40 vascular plant species, including three subspecies. There are 24 native species, 10 established alien species, and six casual alien species. Comparing to previous data (Zając & Zając 2001, Pliszko 2014, 2015a, b, 2016 and the literature cited therein), *Aronia ×prunifolia* (Marshall) Rehder, *Atriplex tatarica* L., *Erigeron acris* subsp. *droebachiensis* (O. F. Müll.) Arcang. and *Rorippa austriaca* (Crantz) Besser are new taxa to

the flora of the Polish part of the Lithuanian Lakeland. A new locality of *Erigeron acris* subsp. *droebachiensis* in Augustów is the north-easternmost point of its occurrence in Poland (Pliszko 2015b). Furthermore, it is worth mentioning that *Oxytropis pilosa* (L.) DC. is a strictly protected species in Poland, whereas *Angelica archangelica* L. and *Centaurium pulchellum* (Sw.) Druce are partially protected taxa (Rozporządzenie 2014). Three species recorded with the new localities in the Western Suwałki Lakeland have been included in the regional red list of vascular plants (Pliszko 2017), namely *Coronilla varia* L. as a vulnerable species and *Senecio sylvaticus* L. and *Stellaria longifolia* H. L. Mühl. ex Willd. as the critically endangered species. The new localities of the above-mentioned species are important for saving native biodiversity. Moreover, among the presented species there are three nationally vulnerable taxa (i.e., *Oxytropis pilosa*, *Potamogeton alpinus* Balb., and *Trifolium rubens* L.), one near threatened species (i.e., *Potamogeton friesii* Rupr.), and two data deficient species (i.e., *Rorippa austriaca* and *Sanguisorba muricata* (Spach) Gremli) (Kaźmierczakowa *et al*. 2016). In spite of the new findings, *Angelica archangelica* subsp. *litoralis* (Fr.) Thell., *Carex* ×*subviridula* Fernald, *Coronilla varia*, *Geranium molle* L., *Heliopsis scabra* Dunal, *Hemerocallis fulva* L., *Senecio sylvaticus*, and *Stellaria longifolia* are still very rare taxa in the Western Suwałki Lakeland (Pliszko 2014). A new record of *Heracleum sphondylium* L. s. str. confirms that the Polish part of the Lithuanian Lakeland is one of the few areas in Poland where this species co-occurs with its closely related congener *Heracleum sibiricum* L., as it was observed in the Wigry National Park (Zych 2004).

Considering the distribution of alien vascular plants in Poland (Zając & Zając 2001), the new records of *Heracleum mantegazzianum* Sommier & Levier, *Lepidium densiflorum* Schrad., *Oxalis fontana* Bunge, *Potentilla intermedia* L. non Wahlenb., and *Solidago canadensis* L. reflect their ongoing geographical range extension to the north-eastern part of the country. Moreover, the casual alien species presented in the list may be established in the Polish part of the Lithuanian Lakeland in the future, especially *Aronia* ×*prunifolia*, *Hemerocallis fulva* and *Sorbaria sorbifolia* (L.) A. Braun which are already established in other regions in Poland (Tokarska-Guzik *et al*. 2012). However, their persistence and spread need to be confirmed in the field.

Floristic list

Explanations: established alien species are indicated with *, casual alien species are indicated with **. The codes of the 10-km square units of the ATPOL cartogram grid (two capital letters and two Arabic numbers) are given in brackets, after the names of the localities.

Angelica archangelica subsp. *litoralis* – near Bakałarzewo (FB06), bank of Rospuda river near Głębokie lake, 25 July 2017.
****Aronia* ×*prunifolia* – Suwałki (FB08), abandoned field, 28 August 2016.
***Atriplex tatarica* – Augustów (FB39), ruderal ground, 27 June 2016.
Berberis vulgaris – Suwałki near Czarnoziem (FB08), thicket, 12 June 2015.
Carex distans – Suwałki (FB08), disused sand and gravel pit, 12 June 2015.
C. ×*subviridula* – Skazdub Stary (FB06), wet meadow, 29 June 2016.
Centaurium pulchellum – Szlinokiemie (FA99), roadside verge, 22 July 2017.
***Corispermum leptopterum* – Gołdap (FA84), ruderal ground, 14 July 2017.
***Cornus sericea* – Suwałki (FB08), abandoned field, 28 August 2016.
Coronilla varia – Krzywólka near Przerośl (FA96), roadside verge, 8 August 2017.
Equisetum hyemale – Żubrówka (GB00), edge of pine forest, 22 July 2017.
Erigeron acris subsp. *droebachiensis* – Augustów (FB39), grassland on edge of pine forest, 18 July 2017.
***Geranium molle* – Filipów Pierwszy (FB06), lawn, 10 July 2017; Gołdap (FA84), lawn, 14 July 2017.
****Heliopsis scabra* – Garbas Pierwszy (FB06), disused sand and gravel pit, 24 July 2017.
****Hemerocallis fulva* – Ludwinowo near Raczki (FB17), roadside verge, 16 July 2017.
***Heracleum mantegazzianum* – Suwałki near Czarnoziem (FB08), mesic meadow, 8 July 2016.
H. sphondylium s. str. – Las Suwalski near Suwałki (FB18), edge of mixed forest, 5 August 2017.
Leontodon hispidus subsp. *hastilis* – Suwałki near Czarnoziem (FB08), xerothermic grassland, 12 June 2015.

**Lepidium densiflorum* – Augustów (FB39), ruderal ground, 27 June 2016; Sobolewo near Suwałki (FB18), disused sand and gravel pit, 30 July 2016.
***Linum usitatissimum* – Augustów (FB39), roadside ditch and verge, 27 June 2016.
**Onobrychis viciifolia* – Szołtany (GA90), xerothermic grassland, 22 July 2017.
**Oxalis fontana* – Gołdap (FA84), ruderal ground, 14 July 2017.
Oxytropis pilosa – Suwałki (FB08), xerothermic grassland near ruderal ground and railway track, 12 June 2015.
Potamogeton alpinus – Szlinokiemie (FA99), waters of Marycha river, 22 July 2017.
P. friesii – Gołdap (FA84), waters of Gołdapa river, 30 July 2015.
**Potentilla intermedia* – Suwałki (FB08), disused sand and gravel pit, 8 July 2016; Augustów (FB39), ruderal ground, 27 June 2016.
Rorippa austriaca – Augustów (FB39), ruderal ground, 27 June 2016.
Salvia verticillata – Szołtany (GA90), xerothermic grassland and roadside verge, 22 July 2017.
Sanguisorba muricata – between Rutka-Tartak and Pobondzie (FA88), roadside verges, 4 August 2015.
Scorzonera humilis – Suwałki near Czarnoziem (FB08), between xerothermic grassland and mesic meadow, 12 June 2015.
Sedum sexangulare – Budzisko (FA89), lawn, 22 July 2017.
Senecio sylvaticus – between Cimoszki and Wojnasy (FB27), 16 July 2017; Augustów (FB39), tree plantation, 18 July 2017.
**Solidago canadensis* – Nowe Motule and Stare Motule (FA97), roadside verge and tree plantation, 2 August 2015; Szołtany (GA90), roadside verge, 22 July 2017.
***Sorbaria sorbifolia* – Suwałki (FB08), disused sand and gravel pit, 26 July 2016.
***Stachys byzantina* – Suwałki (FB08), disused sand and gravel pit, 19 July 2017.
Stellaria longifolia – between Cimoszki and Wojnasy (FB27), forest, 16 July 2017.
Trifolium campestre – Budzisko (FA89), lawn and ruderal ground, 22 July 2017.
T. rubens – Szołtany (GA90), xerothermic grassland, 22 July 2017.
Verbascum ×semialbum – Augustów (FB39), ruderal ground, 27 June 2016.
Veronica hederifolia – Suwałki (FB08), lawn in the park, 8 May 2016.

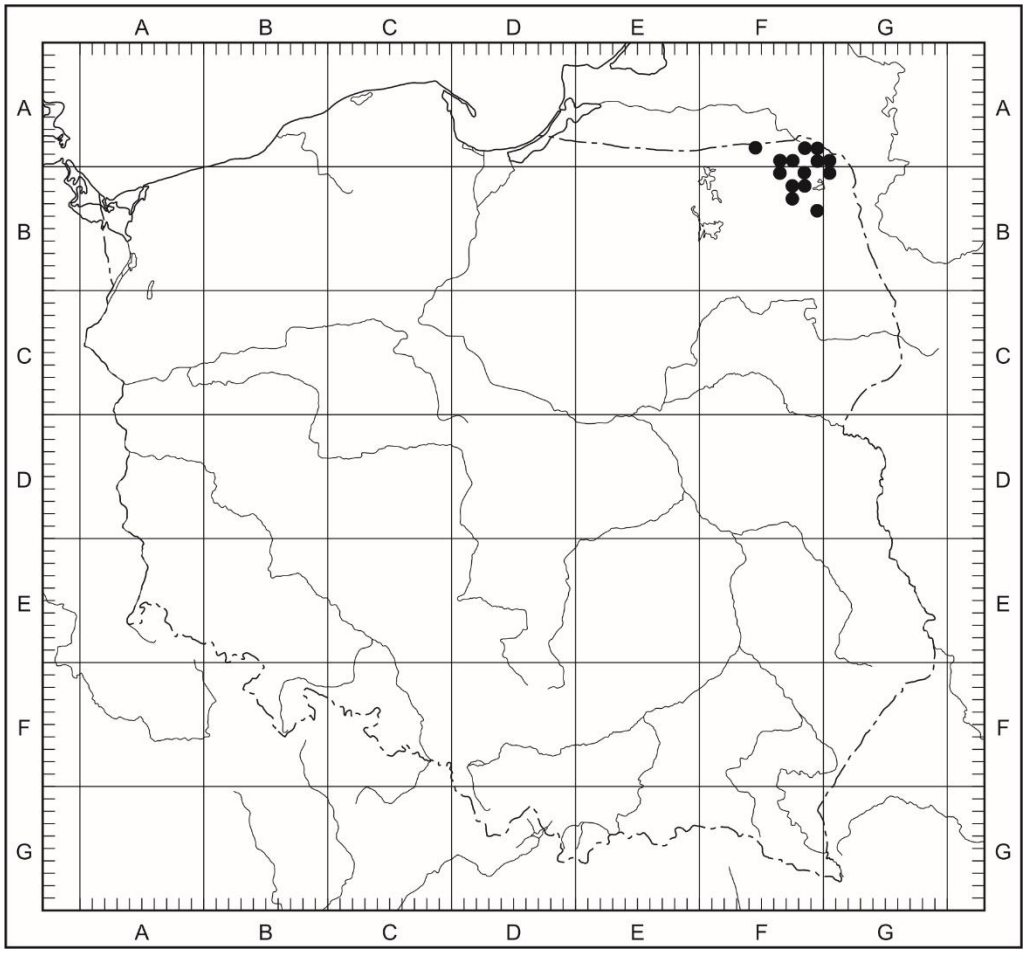

Fig 1: Localization of the study area (black dots) within the ATPOL cartogram grid

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